Olystar 80S

AEG
OLYMPIA

Configuration manual
Main board
Utility programs

5/613/0600 (13)

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General information

This chapter explains the preparatory work to be carried out, and the operating controls you need to know, before you actually begin to use the computer.

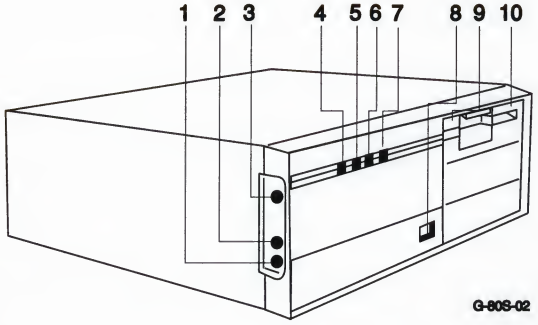
In order to guarantee problem-free running of your computer, always consider the following points:

- After turning the system off, wait a few seconds (approx. 1/2 min.) until the hard disk has stopped before turning it on again.
- Connect or remove the power cable only when the system is turned off.
- Protect the system from extreme temperatures, high humidity, direct sunlight and heat sources.
- The system is secured against overheating, according to VDE regulations. Ensure that the air vents on the monitor and CPU are free. Make sure that no liquids can get into the system. Where the system is subject to a dusty atmosphere, regular maintenance by service personnel is advantageous.
- When large files are being created or edited, regular storing on disk, hard disk or streamer tape is sensible, so reducing the risk of loss of data, for instance, through a sudden power failure.

■ Unpacking

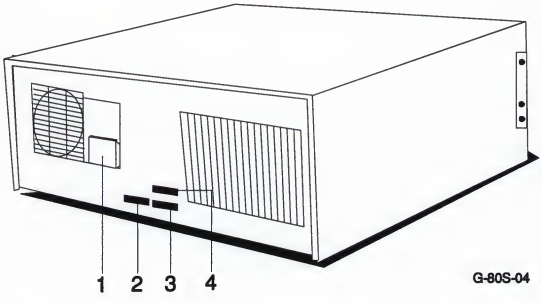
The following items are supplied with the system

Operating instruction manual
MS-DOS manual
MS-DOS system disk
Utilities disk



1 Keyboard connector
2 Mouse connector
3 Keyboard lock - unlock to access the system
4 Reset button
5 Power On lamp
6 Hard disk lamp - indicates the hard disk is in operation
7 Speed indicator lamp (MHz) - indicates the system is working at top speed
8 On/Off switch
9 Disk drive A
10 Disk drive A lamp - indicates the disk in drive A is in operation

■ Rear view



1 Power cable socket
2 COM 1
3 COM 2
4 Parallel port

Machine view

C.1 Software configuration (Setup)

Operating procedure

After installing certain additional units, the Setup program should be carried out. The program is stored in ROM BIOS. The unit features a backup battery that maintains a special memory and clock, even when the computer is turned off. The special memory keeps track of time, date, memory size and types of devices that are attached to the computer (hard disks, flexible disks, monitor types, and screen sizes). A program called Hardware Setup brings this special information into active memory.

When power is first applied to the unit, the system runs several internal tests, called Level 0 Diagnostics routines. After these diagnostic tests are run, the system checks the contents of the special memory for one of the following conditions:

- a loss of battery power has occurred
- the data in the special memory is incorrect because the configuration has changed
- the system has never been set up for operation

When one of these conditions exists, the system displays the relevant message.

In order to start the CMOS Setup routine, press :
Control + Alt + Esc simultaneously.

The system configuration displayed in the menu can be altered if necessary. Use the cursor keys to move to the position and enter the new parameters.
If, at this point, your entries are not accepted, or a message appears that a hard disk is not available, the hard disk must be physically formatted.
During the physical formatting procedure the system asks for the head and cylinder numbers of defect tracks. This information is noted by the manufacturer on the hard disk housing; so the system must be turned off, the CPU housing removed, the defect tracks noted and the housing reassembled. Turn the system on again and activate the Hardware Setup. This can be done in one of two ways:

1. Press Control + Alt + Esc simultaneously.
2. Call in Setup from the utilities program; enter: **sysconf/setup**

The Setup Menu appears on the screen.

```
SETUP Utility Version X.X
Copyright (C) 1989 AEG Olympia

<1>---->Setup System Configuration
<2>---->Fixed Disk Physical Format
<3>---->Set system password
```

Option 1- the system is configured. It has the same effect as the
Option 2- the hard disk is physically formatted.
Option 3- the system is allocated a password.

After selecting option 2, the hard disk must be configured and formatted with the FDISK and FORMAT C: /S commands. Contact your supplier if you require further information.

C

■ Entering parameters

Use the worksheet depicted below to record the parameter settings entered in the Hardware Setup program. Follow the instructions in this section to declare certain conditions to the operating system.

Page 1

Date:	__ -__ -_____ (mm-tt-jj)
Time:	__ :__ :_____ (hh-mm-ss)
Floppy Drive A:	
Floppy Drive B:	
Fixed Disk 0:	
Fixed Disk 1:	
WDD Write Protect:	
FDD Write Protect:	
Total Memory	
Base Memory:	
Extended Memory:	
Math Coprocessor:	
Primary Display:	

Page 2

Shadow RAM
System BIOS:

Video:

Onboard Input/Output Ports

Serial Port 1:

Serial Port 2:

Parallel Port:

Communication Status

Baud Rate:

Parity:

Stop Bits:

Data Length:

CPU Speed:

■ Date

To set the date select the relevant option in Setup and press Return

The screen displays:

MONTH:
DAY:
YEAR:

The valid entries are:
Month: 1 to 12
Day: 1 to 31
Year 1900 to 2099

■ Time

To set the time select the relevant option in Setup and press Return

The screen displays:

```
HOUR:
MINUTE:
SECOND:
```

The valid entries are:
Hour: 00 to 23
Minute: 00 to 59
Second: 00 to 59

■ Disk drive A

For disk drive A select the relevant option and enter the corresponding value for the type of drive.
@. = NOT PRESENT
1 = 360KB FLOPPY DRIVE
2 = 1.2M FLOPPY DRIVE
3 = 720KB FLOPPY DRIVE
4 = 1.44M FLOPPY DRIVE
? =

■ Disk drive B

If a second disk drive has been installed, select the relevant option and enter the corresponding value for the type of drive.
@.= NOT PRESENT
1 = 360KB FLOPPY DRIVE
2 = 1.2M FLOPPY DRIVE
3 = 720KB FLOPPY DRIVE
4 = 1.44M FLOPPY DRIVE
? =

■ Hard disk 0

If a hard disk has been subsequently installed, select and enter the corresponding hard disk type, according to the hard disk kit. The type is dependent on the number of cylinders and read/write heads.
FIXED DISK 1: NOT PRESENT
@.= NOT PRESENT
1-47 TYPE or 60-XX TYPE
? =

■ Hard disk 1

If a hard disk has been subsequently installed, select and enter the corresponding hard disk type, according to the hard disk kit. The type is dependent on the number of cylinders and read/write heads.
FIXED DISK 1: NOT PRESENT
@.= NOT PRESENT
1-47 TYPE or 60-XX TYPE
? =

■ Write protection

It is possible to write protect both the hard (fixed) disk and disk drives. The standard value for the two write protect parameters is **Normal**. If you select **Protect**, for either of the twp parameters, data cannot be copied onto the devices.
The main function of this option is to protect the system from program viruses.

■ System memory

The system automatically detects the total amount of onboard memory, and sets the corresponding value in the SETUP program. This value cannot be adjusted manually, and is for display only.
If additional memory is installed, the system automatically resets the total memory parameter to show the new size.

■ Coprocessor

The system automatically detects which coprocessor is installed, and displays it in the SETUP.

■ Monitor type

Select the option to enter the type of monitor. There are four possibilities.
PRIMARY DISPLAY: MONOCHROME
1. COLOR/GRAPHICS 40 COLUMN
2. COLOR/GRAPHICS 80 COLUMN
3. MONOCHROME
4. SPECIAL ADAPTER
?=

■ BIOS location modes

The computer reserves 128 Kb RAM for the basic operating routines which are normally located in the ROM. This memory area is write protected and is known as shadow RAM.
The shadow RAM parameter allows you to change the system BIOS and vidoe BIOS locations from ROM to RAM. To do this, select the Enable option of either of the two parameters.

■ Communication status

The communication status parameters enable the following settings to be defined:
- Baud Rate: 1200 - 9600 bps.
- Parity: Odd or even.
- Stop bits: 1 or 0.
- Data length: 7 or 8 bit.

If your data length is set to 8 bit, one of the following must be selected:
- 0 stop bit and parity on

or
- 1 stop bit and parity off

The standard values are:
- 9600 bps
- parity off
- 1 stop bit
- 8 bit data

■ Processor speed

This parameter allows you to set the CPU speed. Select the required value with the Cursor keys.

■ Exit SETUP

When you are satisfied with all the configuration settings, press Esc to exit from the Setup Menu. All the set values take effect.

System password

This option sets the system password request which appears at the DOS prompt when the system is booted. The system password secures the system data against unauthorized access.

■ Entering a password

Select option 3 in the Setup Main Menu.
Enter the password; a maximum of 7 characters can be used. All the letter and number characters on the keyboard may be used.
The characters entered do not appear on the screen. Confirm your entry by pressing the Return key.
When the password has been entered correctly, the system, to ensure accuracy, requests you to retype the password before it is set.
Each time the system is subsequently booted, the request for your password appears.

Note:
Do not forget your password. Write it down and store in a safe place if necessary.

■ Disabling a password

To disable (turn off) the password, enter it followed by a /.

■ Changing a password

To change the password, enter it followed by a / and a **new name**.
Press the Return key to confirm your new password.

■ Password with setup

If a password has been allocated and you want to recall the Setup Menu, you will be requested to enter the password again.

■ Forgotten password

Should you forget the password, proceed as follows.
All the necessary information on opening the system and locating the relevant jumper is in Chapter E.

Turn off the system and unplug all the cables on the rear panel.
Open the system cover and locate jumper J7.
Remove the cap from pins 1 and 2, and place on pins 2 and 3 for a few seconds.
Replace the cap on pins 1 and 2.
Replace the system cover and cables.
Re-run the Setup program and reset all the parameter values. (This is because the process causes a short circuit in J7 which clears all the values stored in the CMOS, including the password).

D.1 Technical Data

D

Central processing unit

Dimensions

Olystar 80S

Width:	570 mm
Height:	380 mm
Depth:	540 mm

System specifications

Components	Standard	Option
CPU	Intel 80386/25	
CACHE	128 Byte	
COPROCESSOR	Socket	80387 or Weitek 3167
SYSTEM BOARD RAM	4 MB	max. 16 MB
BIOS ROM	64 KB	
CMOS RAM	128 Bytes, battery backup	
DRIVES	3.5" 1.44Mb disk drive	1 hard disk
SLOTS	6 x 16-bit 1 x 8 bit	
VIDEO	Optional	
CONNECTORS	1 x 25-Pin Serial 1 x 9-Pin Serial 1 x 25-Pin, Centronics compatible parallel 1 x PS/2 compat. mouse	
KEYBOARD	MF2	102-key enhanced
POWER SUPPLY	145 Watts	

Noise level

Operation: 40dB

■ Interrupt control

Priority	Cllr. No	Interrupt No	Interrupt Source
1		NMI *	Parity error detected
2	1	IRQ 0	Interval timer, counter 0 output **
3	1	IRQ 1	Keyboard **
-	1	IRQ 2	Interrupt from controller 2 (cascade)
4	2	IRQ 8	Real time clock **
5	2	IRQ 9	Cascade to INT 0AH (IRQ 2)
6	2	IRQ 10	Reserved
7	2	IRQ 11	Reserved
8	2	IRQ 12	PS/2 mouse ** or reserved for user
9	2	IRQ 13	INT from 80387SX coprocessor **
10	2	IRQ 14	Fixed disk controller **
11	2	IRQ 15	Reserved
12	1	IRQ 3	Serial communication port 2 **
13	1	IRQ 4	Serial communication port 1 **
14	2	IRQ 5	Parallel port 2
15	1	IRQ 6	Diskette controller **
16	1	IRQ 7	Parallel port 1 **

* = NMI Signal is controlled by I/O Port hex 70 bit 7
** = Unit preinstalled and interrupt code is used

Central processing unit

■ Allocation of I/O addresses

Address Range (hex)	Device
000 - 01F	DMA controller-1
020 - 027	Interrupt controller-1
030 - 037	Interrupt controller-1
040 - 047	System timer
050 - 057	System timer
060 - 06F	Keyboard controller
070 - 07F	Real-time clock, NMI mask
080 - 09F	DMA page register/speed status register
0A0 - 0BF	Interrupt controller-2
0C0 - 0DF	DMA controller-2
0F0	Clear math coprocessor busy
0F1	Reset math coprocessor
0F8 - 0FF	Math coprocessor
800 - 8FF*	NVRAM address
C00*	NVRAM page address
C02*	RAM BIOS/ROM BIOS control Second-level cache control Fast gate A20 control
C03*	Reserved
C04*	Clear flush/write-back latch
C05*	LED interface
C07*	Internal cache flush

■ System memory summary

The following table shows how the system memory and I/O addresses are allocated.

Address Range (hex)	Description
0000000 - 009FFFF	640 KB system memory (onboard DRAM)
00A0000 - 00BFFFF	128 KB video RAM (for video display buffer)
00C0000 - 00DFFFF	128 KB I/O expansion RAM (for ROM I/O adapters)
00E0000 - 00EFFFF	64 KB Reserved onboard (for video RAM BIOS)
00F0000 - 00FFFFF	64 KB BIOS (System ROM or RAM BIOS)
0100000 - 0F9FFFF	System memory, 384 KB I/O (onboard DRAM)
0FA0000 - 0FFFFFF	Adapter memory (software programmable; if disabled, address is reserved for add-on cards)
1000000 - 3FDFFFF	System memory (onboard DRAM)
3FE0000 - 3FFFFFF	128 KB system ROM (mapped to the same ROM area as 00E0000 to 00FFFFF)

■ Hard disk table

Type	Cylinder	Heads	Write Prec	Land Zone	Sect/Track
0	indicates no SCSI or hard disk				
1	306	4	128	305	17
2	615	4	300	615	17
3	615	6	300	615	17
4	940	8	512	940	17
5	940	6	512	940	17
6	615	4	0FFFFH	615	17
7	462	8	256	511	17
8	733	5	0FFFFH	733	17
9	900	15	0FFFFH	901	17
10	820	3	0FFFFH	820	17
11	855	5	0FFFFH	855	17
12	855	7	0FFFFH	855	17
13	306	8	128	319	17
14	733	7	0FFFFH	733	17
15	reserved				
16	612	4	0	663	17
17	977	5	300	977	17
18	977	7	0FFFFH	977	17
19	1024	7	512	1023	17
20	733	5	300	732	17
21	733	7	300	732	17
22	733	5	300	732	17
23	306	4	0	336	17
24	612	4	305	663	17
25	306	4	0FFFFH	340	17
26	612	4	0FFFFH	670	17
27	698	7	300	732	17
28	976	5	488	977	17
29	306	4	0	340	17
30	611	4	306	663	17
31	732	7	300	732	17
32	1023	5	0FFFFH	1023	17
33-35	reserved				
36	1024	5	0FFFFH	1024	17
37-44	reserved				
45	1024	8	0FFFFH	1024	17
46-59	reserved				
60	1024	9	0	1023	17
61	1224	7	0	1223	17
62	1224	11	0	1223	17
63	1224	15	0	1223	17
64	1224	8	0	1223	17
65	1224	11	0	1223	17
66	918	11	0	1223	17
67	925	9	0	926	17

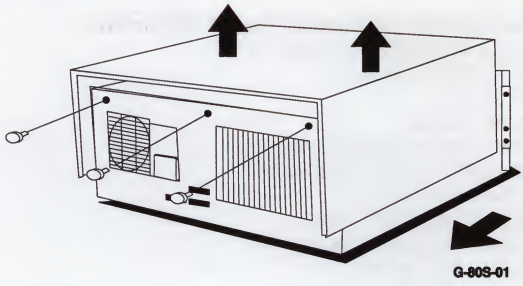
Central processing unit

Type	Cylinder	Heads	Write Prec	Land Zone	Sect/Track
68	1024	10	0	1023	17
69	1024	12	0	1023	17
70	1024	13	0	1023	17
71	1024	14	0	1023	17
72	1024	2	0	1023	17
73	1024	16	0	1023	17
74	918	15	0	1023	17
75	820	6	0	820	17
76	1024	5	512	1023	17
77	1024	8	512	1023	17
78	1224	7	0FFFFH	1023	17
79	1224	11	0FFFFH	1023	17
80	1224	15	0FFFFH	1023	17
81	1024	7	0FFFFH	1023	17
82	1024	11	0FFFFH	1023	17
83	1024	15	0FFFFH	1023	17
84	776	8	0FFFFH	775	33
85	926	13	0FFFFH	926	17
86	805	4	0FFFFH	805	26
87	976	5	0FFFFH	976	17
88	745	4	0FFFFH	760	28
89	747	2	0FFFFH	760	28
90	782	2	0FFFFH	862	28
91	1366	8	0FFFFH	1366	38
92	816	15	0FFFFH	816	32
93-254	reserved				
255	user defined				

E.1 Options

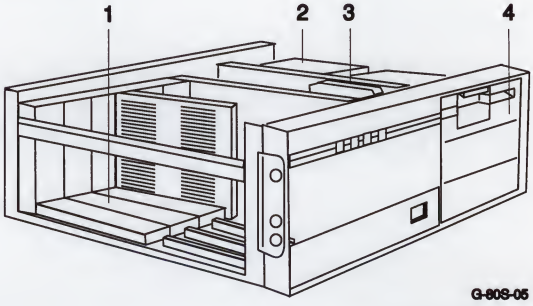
System assembly and dismantling for extensions

■ Opening the system housing



- Turn off the system and unplug all the cables.
- Remove the screws from the rear panel.
- Hold the system housing at the sides, slide back and lift up.

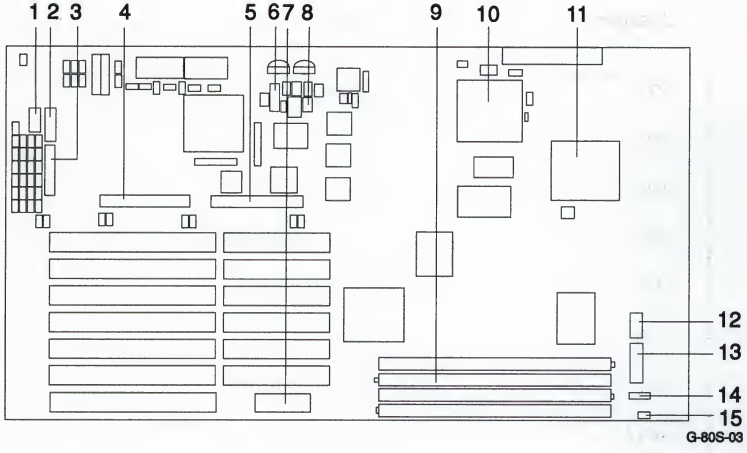
■ Internal components



1 Slots
2 Power supply
3 Hard disk C
4 Disk drive A

System assembly and dismantling for extensions

■ Main board



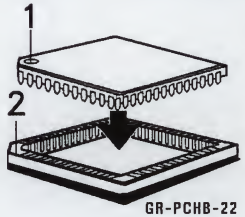
1 COM port 1 (J1)
2 COM port 2 (J2)
3 Parallel port 1 (J3)
4 FDD connector (J4)
5 WDD connector (J5)
6 Battery connector (J6)
7 ROM
8 System password (J7)
9 DRAM area
10 CPU
11 Coprocessor socket
12 LED connector (J14)
13 Keyboard/Mouse connector (J15)
14 WDD LED (J16)
15 System lock (J17)

■ Jumper settings

Jumper	Function
JP1	COM port 1
JP2	COM port 2
JP3	Parallel port
JP4	Disk drive connector
JP5	WDD connector
JP6	Battery connector
JP7	System password
JP14	LED connector
JP15	PS/2 keyboard and mouse connector
JP16	WDD LED connector
JP17	System lock

■ Installing a coprocessor

The installation of a coprocessor can improve the system performance.



- Note that the markings on the chip and socket are aligned.
- Insert the coprocessor in the socket.

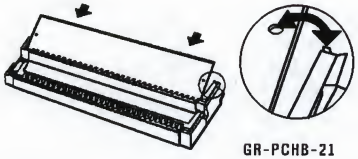
System assembly and dismantling for extensions

■ RAM extensions (80ns SIMMs)

RAM	Bank 0	Bank 1	Bank 2	Bank 3
4 MB	4 MB	0	0	0
5 MB	1 MB	4 MB	0	0
8 MB	4 MB	4 MB	0	0
12 MB	4 MB	4 MB	4 MB	0
16 MB	4 MB	4 MB	4 MB	4 MB

■ Installing SIMMs

Install SIMMs beginning with **Bank 0** and moving to **Bank 3**.
To remove SIMMs, begin with Bank 3 and work down to Bank 0.



Insert the board at an angle of 45°, with the component side up, in **Bank 0**.
Press the board gently back until it is securely in place.
To remove SIMMs, draw the board forward, and when it snaps free, lift it carefully out.

After installing or removing SIMMs, reboot the system to reconfigure it. If an error message appears concerning the memory size, enter Setup to alter incorrect values. Press the Esc key twice to exit Setup.

■ Installing extension boards

The system has seven slots available for extension boards, one 8-bit and six 16-bit.

- Loosen the screw and remove the bracket from an empty slot. (Save the screw to secure the board).
- Align the board with the slot guides and gently insert the board until it is securely in place.
- Fasten the board with the bracket screw.

System assembly and dismantling for extensions

■ Removing extension boards

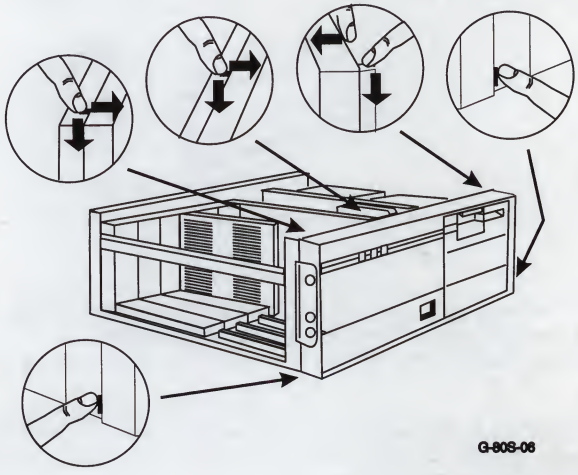
- Unplug any cables connected to the board.
- Loosen the screw and pull the board gently from the guide.
- Replace the bracket and screw into place.

■ Installing disk drives

It is possible to install additional disk drives in the system.

■ Removing the front panel

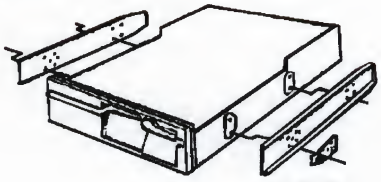
- Remove the system housing (see "Opening the System Housing")



- Insert a screwdriver in the opening by one of the lower side clips, and gently pry the clip outwards. The clip is released.
- Repeat on the other lower side clip. The bottom section of the front panel is released.
- Press down the three upper retaining plates (which are indented) and pull the panel to release the top part of the front panel.
  The front panel can be removed.

System assembly and dismantling for extensions

■ Assembling and inserting a drive



GR-PCHB-13

- Attach the guide rails to the disk drive.
- Remove the disk drive cover plate, on the front of the system, by pressing it until it releases.
- Slide the disk drive into the drive bay until it clicks into place.
- Tighten the screws to secure the drive.
- Plug the 34-pin cable into the relevant socket at the rear of the drive.
- Plug in the power supply cable.
- Run the Setup program to reconfigure the system for the additional drive.

System assembly and dismantling for extensions

F.1 Utility programs

EMM (Expanded/Extended Memory Manager)

EMM allocates about 64 Kb of the memory area between 640 Kb and 1 Mb (expanded memory), plus the extended memory in the address area from 1 Mb to 16 Mb. The extended memory is handled in units of 16 Kb, and so EMM should be allocated an even multiple of 16 Kb.
The EMM device driver requires approximately 6 Kb of disk space.

■ Quick-Start instructions

If you already understand EMM and you only wantto install it, carry out the following operations.

1. Copy the file EMM.EXE from the Utility Disk into the MS-DOS directory on your hard disk.
2. Enter a DEVICE=EMM.EXE in the CONFIG.SYS file. Place the EMM entry before entries for any other programs that use extended or expanded memory.
3. Reboot the system to install the new CONFIG.SYS device assignment.

■ Terminology

The system has 4 major memory categories.

1. Conventional memory:
   The first 640 KB of memory. MS-DOS version 3.X and below can only address this range.
2. Controller:
   Memory in the range 640 KB to 1 MB is reserved for RAM BIOS and device controllers.
3. Extended memory:
   Memory area between 1Mb and 16Mb. This area can only be accessed by operating systems such as OS/2.
4. Expanded memory:
   Memory above 640Kb, accessed in blocks of 16Kb.

■ Acronyms

1. **EMS:**
   The Expanded Memory Specification (EMS) describes a way to expand the memory addressing capabilities of the Intel 8088, 80286, 80386, 80486 micro processors.
2. **EMM:**
   An Expanded Memory Manager (EMM) is software that provides an EMS interface between the memory hardware and an application program.
3. **LIM:**
   Lotus, Intel and Microsoft, originators of EMS.
4. **VCPI:**
   VCPI is the Virtual Control Program Interface. It is a protocol for 386/486 computers.
5. **XMS:**
   The eXtended Memory Specification is a program for allocating extended memory.

EMM (Expanded/Extended Memory Manager)

■ EMM Installation

Requirements:
You can run EMM on 386/486 computers with MS-DOS 2.11, 3.0, 3.1, 3.2, 3.21, 3.3 and higher.
Later releases of DOS may not be not be supported by the current EMM version.

EMM requires extended memory equal to the amount of memory you plan to allocate as expanded memory. Any memory beyond the basic 640 Kb is typically extended memory that EMM may utilize.

On a 386/486 system, EMM allocates 64 Kb of controller address space as the resident page frame. If a contiguous 64 Kb of controller address space is not available, you must direct EMM to allocate the page frame in the conventional memory.

Additional conventional memory is required for the device driver code and control tables. The amount is about 25 Kb on a 368/468 system with 8 Mb of managed memory.

The HIGH parameter used on 368/468 systems causes EMM to load into extended memory, thus requiring less than 1 Kb of conventional memory plus 32 Kb of extended memory.

■ Installation summary

The simplest way to install the EMM device driver:
- Copy the **EMM 386.SYS** file onto the hard disk.
- Enter **DEVICE=EMM 386.SYS** in the CONFIG.SYS file and reboot the system.

Installation:
If you have any other devices that might compete for access to extended memory, or if you will be using any communication products during acces to extended memory, use the following complete description of the EMM CONFIG.SYS entry:

```
DEVICE = [d:] [path ] EMM.EXE
         [size [where2]]
         [(size2 [where2])]
         [HIGH]
         [HIMEM]
         [INTEL]
         [PORT=addr1[-/addr2/addr3/addr4]]
         [ROM[=addr1-addr2]]
         [EMS=addr1-addr2]
         [EXCLUDE=addr1-addr2]
         [HIDOS=addr1-addr2]
         [FRAME=addr]
         [TSIZE=n]
         [HANDLES=n]
         [DESHADOW]
         [ALTMAP]
         [INT15]
         [HIGH_ IO]
```

EMM (Expanded/Extended Memory Manager)

Enter the following commands at the DOS level:

EMM MAP
EMM LOADHI [d:][path]program_ name.ext

Note:
You can bypass the EMM initialization by pressing Ctrl +Alt +Shift .

[d:][path] is the drive and directory path containing the EMM.SYS file.

Size
Is the size of the extended memory, specified as a decimal integer value that is a multiple of 16 Kb. The default value is all of the extended memory (addresses between 1024 Kb and 16384 Kb) available on your computer and not being used by other programs. Enter a value of 0 (zero) as a place marker if you intend to enter any following parameters. **EMM** can only handle memory in even multiples of 16 Kb. it issues a warning for an improper memory value, and uses the next lowest 16 Kb multiple.

Where(limited application)
Is the starting location of the extended memory to be managed. It is specified as a decimal integer vale in Kb. The default value is the top of memory minus the size of area of memory to be managed. As EMM allocates memory from the top down, it is not recommended. However, it gives complete control over memory assignment in certain situations.

Size2 (only with 386)
It specifies the amount of memory in a contiginous block. Typical sizes are 256 Kb and 384 Kb. If only discontiguous memory is to be managed, omit any size parameter. If both standard and discontiguous memory are to be managed, size parameter must be specified. Enclose the “size2" parameter in parentheses.

Where2 (only with 386)
States the location of the discontiginous block of extended memory specified with the “size2" parameter. Default is 16000 Kb.

HIGH
Specifies that **EMM** is to loaded into HIGH memory. This mode requires less than 1 Kb of conventional memory.

HIMEM
Specifies that **EMM** is to provide XMS protocol support for the allocation of extended memory.

INTEL
Specifies that Intel architecture hardware is to be utilized. This support works on a number of clone memory boards. **EMM** may be used instead of the software which came with the board as a means of supporting **EMS 4.0** or for avoiding problems with that software.

This option invokes support for a 64Kb page frame that is dynamically located by software support. EMM will typically allocate the page frame by jumpers or setup software, then it is necessary to use a FRAME=xxx option to identify the frame

location chosen. EMM tests for 1/0 port addresses 208/218/258/268/2A8/2B8/2E8. If the board uses another address, then the PORT=xxx option must be used to identify the address.
If multiple boards are installed in the machine, use multiple PORT options ID to specify their addresses.

PORT=addr1/addr2/addr3/addr4
Specifies the port address(es) to be utilized for access to EMS hardware. The default procedures scan through a list of addresses, checking each address for proper function as **EMS** memory. If other hardware is present at these addresses and can not tolerate the tests for **EMS**, then this option may be used to limit the testmg to the specified port.
If a single address is specified, it is used as the base address for the hardware. The base address controls the 16 Kb page within the page frame that is on a 64 Kb boundary. The other three 16 Kb pages are controlled by addresses base 4000h, 8000h, and C000h.
If all four addresses are specified, then each address controls a 16 Kb page in the order specified.

ROM[=addr1-addr2]
Specifies that ROM in the controller address space is to be mapped into RAM. If no address range is specified, then all ROM (BIOS and EGA/VGA BIOS) will be identified and mappped into RAM. If an address range is specified, then only that range will be mapped. Mapping the EGA/VGA BIOS to RAM (ROM=C000-C3FF) significantly improves performance if the function has not already been done with the BIOS. ROM mapped to RAM in this manner is read-only.

EMS=addr1[-addr2]
Specifies additional controller address space that is to be made available for mapping as expanded memory pages. Without the **EMS** parameter, only the four 4 14 Kb pages that make up the page frame are defined. If additional space is available in controller memory (not being used as ROM for display adaptors or the BIOS), then it may be assigned as additional EMS pages. Areas identified by the MAP function as "UNUSED"are probably available.

EXCLUDE=addr1-addr2
This excludes the specified area from consideration as a page frame area. This may be necessary if the default procedures fail to identify an area as already in use.
The default tests for RAM are not done in areas identified by an EXCLUDE parameter. Normally, **EMM** diagnoses memory locations in the range A000-FFFF to determine the presence of RAM. The diagnostic RAM test causes problems with some memory mapped 1/0 adaptors.
The EXCLUDE parameter is required to bypass such testing. Since the page frame, HIDOS, and EMS areas of controller memory may not overlap areas required for other functions, it is necessary to identify such areas by the ROM/RAM tests, or with the EXCLUDE command.

HIDOS=addr1-addr2
Specifies controller address space that is to be made available for device driver and application program usage. The LOADHI function can be used to load programs into the area defind for HIDOS usage. An otherwise unused area of controller address space may be defined for either EMS or HIDOS usage. See the EMS and MAP parameter descriptions for further information.

EMM (Expanded/Extended Memory Manager)

A 386 machine with only 512 KS of conventional memory can be filled out to 640 Kb by defining HIDOS=8000-9FFFF. If the A000 area is not required for the display adaptor (CGA or Monochrome/Hercules), then DOS may be filled out to 704 or 736 Kb. Specify HIDOS=A000-A7FF for a monochrome adaptor, or HIDOS=A000-B7FFF for CGA. A HIDOS area that is contiguous with the normal DOS area simply increases the size of the area avallable for normal DOS usage. The LOADHI procedures are not required for such an area. An additional HIDOS parameter may be defmed for LOADHI usage.

FRAME=addr (386/486 only)
Specifies the page frame address. If the frame address is not specified, memory is scanned from E000 to C000, looking for an available 64 Kb address window. If one is found, then it may generally be used without the FRAME option. If the automatic procedure can not locate an area, or if it results in conflicts with nonstandard adapter boards, then the FRAME option may be used.
It may be possible to allocate the page frame at E000, depending upon the particular BIOS installed in the machine. IBM defines the 64 Kb area at E000 as reserved, but the area is, in fact, available for usage on many compatible machines.
If no controller address space is available, then the parameter FRAME=LOW may be used to allocate a 64 Kb area in conventional memory, as is done on the 286.

TSIZE=n
This entry transfers n bytes at a time per access. The default is 16384 bytes. Since interrupts are disabled during a transfer, interrupt driven processes, such as mouse drivers and communication handlers, may lose data if the full 16384 bytes are transferred all at once. Communication at speeds over about 1 bps will probably require reduction of this value. If you experience problems with mouse operation, try TSIZE = 8192.

HANDLES=n (limited application)
This allocates memory for the specified number of EMS handles. The default value is 32; minimum is 2, maximum is 255.
An application program identifies a block of pages with a handle number returned to it when expanded memory is allocated to it. Each potential handle number that can be allocated requires memory in which to save the environment associated with that handle value. This value may be reduced to conserve memory, or increased to support an environment which requires an unusually high number of handles.

DESHADOW
This causes EMM to remove shadowing of the display adaptor BIOS in the E000 area. Interrupt vectors which point to code in the area are redirected to the same code in the C000 area. If the code is not duplicated in the C000 area, then the parameter is rejected.
The EMM MAP function may be used to identify where DESHADOW may be used effectively. If the map identifies the E000 area as a mirror image of C000, then DESHADOW can probably be used to free up the E000 area.

ALTMAP (limited application)
This invokes EMS page numbering required by PARADOX version 3 on a 386/486 machine.

INT15 (limited application)
This invokes INT 15, subfunction 87, for transfer of data between extended and conventional memory. The INT15 option is useful on machines that have an otherwise unsupported address line 20 control or an alternate implementation of extended memory.

HIGH IO (limited 386/486 application)
This enables use of 1/0 device addresses above 4EF. The standard permission vector table enables direct I/0 to devices in the range 000 to 4FF. This parameter enables direct I/0 to devices in the range 0000 to FFFF. This is the default on 386/486 PS/2 machines. The maximum size permission vector table invoked by this parameter reduces the available expanded memory by 16 Kb.

MAP
This is issued at DOS command level by using command EMM MAP. Note that the same EMM.EXE FIle is used both in the CONFIG.SYS file and for the DOS level command. The MAP function is available only at DOS command level. Areas reported as "USUSED" on 386/486 systems may generally be used for EMS or HIDOS usage.

LOADHI [d:][path][program name.ext (386/486 only)
This command loads the DOS program into the HIDOS (controller) address space. This command is available at the DOS command level, similar to the EMM MAP command. This function may be used to free up space in the lower 640 Kb that would otherwise be used for resident programs.
Device drivers are loaded into the HIDOS (controller) address space with the LOADHI parameter used in the CONFIG.SYS File. The HIDOS area must be defined by a "DEVICE = EMM.EXE parms" line. A device driver Is loaded into HIDOS memory with an additional entry in CONFIG.SYS of the form "DEVICE = EMM.EXE LOADHI drivername.sys driverparms".

Note that some programs may not be able to function in HIDOS memory, due to the unusual memory configuration. If use of a HIDOS application prevents normal completion the DOS startup, it is necessary to modify the CONFIG.SYS file to avoid the program application.

■ HIDOS Memory

EMM can load device drivers and application programs into available controller space on 386, 386SX and 486 systems. Most systems can only use the first 640 Kb of memory, and any technique that reduces the demand for the first 640 Kb makes more of it available to other programs.
To utilize HIDOS memory, EMM must be instructed which address space is to be managed. The EMM MAP is the primary tool for this.
Issue the EMM MAP command to DOS and identify the the largest area described in the map as "UNUSED". A typical area would be C800-DFFF or 96 Kb. If there are network adaptors or other advanced devices installed in the system, they may not be detectable by the MAP process.
Having identified an available address range for HIDOS usage, enter a "HIDOS=addr1-addr2" parameter on the first DEVICE=EMM.EXE line in the CONFIG.SYS file. Device drivers are loaded into the HIDOS area by utilizing the EMM LOADHI function. After the line in the CONFIG.SYS defining the HIDOS area, enter a line DEVICE=EMM.EXE LOADHIxxxx, where xxxx is the part used to install the file.

Application programs are loaded into the HIDOS area by utilizing the EMM LOADHI function at DOS level
The same EMM.EXE file is executed at DOS level as is used in the CONFIG.SYS file. Unlike the CONFIG.SYS file usage of LOADHI, the PATH data is available for usage by EMM at DOS level.
The primary problem with loading programs into HIDOS memory is that the available space is quite restricted. Programs are designed for a DOS environment that makes more than 500 Kb for initialization, and the HIDOS area may be as small as 4 Kb. There are also problems with programs using unusual addresses. Therefore, there are programs which will not operate in the HIDOS area although there is enough space available.

■ EMM Messages

EMM: Memory used = xxxx KB (yyy pages), at zzzz KB,
Frame = xxxx
Amount and location of memory being managed by EMM.
Suppress with **/QUIET**.

EMM: Invalid option starting:xxxx
Invalid data on the Device= line in the CONFIG.SYS file.

EMM: Paging area specified is not available
Paging area specified is not available for EMM. Either it does not exist, or is being used.

EMM: TSIZE option too long - limit is 16384
A TSIZE switch on the Device= line in the CONFIG.SYS file contains an invalid value. The TSIZE option limits the number of bytes transferred per page access on a 286 system. Since interrupts are disabled during transfer of data, mouse or communication line data may be lost if the transfer takes too long. The smaller the TSIZE value, the higher the interrupt rate that can be supported. Reducing the TSIZE value may decrease EMM performance.

EMM: Unsupported machine type
EMM operates on 286 and 386 systems only.

EMM: No expanded memory available
Memory either does not exist, or is already allocated for use by another program.

EMM: Controller Memory Full-Page Frame could not be allocated.
Requires a 64 Kb area, aligned on a 16 Kb boundary, for the page frame. The installed hardware does not have such space available. See the FRAME option for possibilities.

EMM: Frame value invalid
The frame value must be in the range A000 to F000, or LOW.

EMM: Protected mode already in use
EMM cannot function with another program that has already invoked protected mode.

EMM: Expanded Memory Manager already installed
EMM, or another expanded memory manager has already been installed. Only the first one is used.

■ Quick reference for programmers

The application program interface to an Expanded Memory Manager (EMM) consists of 30 functions accessed via interrupt 67h. The function code is in register AH, and function specific parameters are in other registers. Upon return from an interrupt 67h, register AH contains a status code.

Data is accessed in units of 16 Kb, called pages, of which up to four may be accessed at any one time. A handle is assigned each time a group of logical pages is requested by function4. Use function 18 to change the number of pages allocated to a handle.

The accessible pages are referred to as physical pages, and are numbered 0 to 3. They reside in the segment identified as the page frame at offsets 0h, 4000h, 8000h, and C000h.A logical page is issued to a physical page with functions 5 or 17. Application code should test for the presence of an EMM before issuing interrupt 67h.

■ Open Handle

The Open Handle technique is designed for programs that issue file system calls to DOS.
It consists of the following steps:
Issue an open handle (DOS function 3Dh) call for the file EMMXXXX0 in read only mode. Note the last character is a zero. If the message "file/path not found appears", EMM is not available.

Issue an "I/O control for devices" (DOS function 44h) with a zero in register AL. Registers ES:DI must point to a buffer, but the EMM does not modify it on this call. Set register CX to 0 (zero) buffer size. If bit 7 of register DX is zero, the EMMXXXX0 is a file and EMM is not available.

Issue an "I/O control for devices" (DOS function 44h) with a 7 in register AL. If the EMM is ready, register AL is set to FFh on return.

Issue a "Close file handle" (DOS function 3Eh) to close the EMM and free up the handle.

■ Get Interrupt Vector

Device drivers and other programs, restricted from using "file system calls", must use the Get Interrupt Vector technique. It checks the contents of the location 0Ah bytes past the segment portion of the int 67h vector for the value EMMXXXX0.
The following numbers (in parentheses) are always in register AX. The completion codes are always returned in register AH.

Function 1 **Get Status (40h)**

Function 2 **Get Page Frame Address (41h)**
Output: BX= segment address of the page frame

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Function 3	**Get Unallocated Page Count (42h)**	
Output:	BX=	number of pages currently available
	DX=	total number of pages in expanded memory
Function 4	**Allocate Pages (43h)**	
Input:	BX=	number of pages to allocate
Output:	DX=	handle to identify this block of pages
Function 5	**Map Handle Page (44h)**	
Input:	AL=	physical page into which the logical page is to be mapped. Range is 0 to 3.
	BX=	logical page to be mapped
	DX=	handle returned from function 4
Function 6	**Deallocates Pages (45h)**	
Input:	DX=	handle returned from function 4
Function 7	**Get EMM Version (46h)**	
Output:	AL=	Expanded Memory Managers version number in BCD. For version 4.0, this value is 40h.
Function 8	**Save Page Map (47h)**	
Input:	DX=	handle under which the status is to be saved
Function 9	**Restore Page Map (48h)**	
Input:	DX:	handle under which the status was saved
Function 10	**Obsolete (49h)**	
Function 11	**Obsolete (4Ah)**	
Function 12	**Get EMM Handle Count (4Bh)**	
Output:	BX:	number of handles active
Function 13	**Get EMM Handle Pages (4Ch)**	
Input:	DX:	handle for which the page count is requested
Output:	BX=	number of pages allocated to the handle
Function 14	**Get All EMM Handle Pages (4Dh)**	
Input:	ES:DI=	1020 byte result area
Output:	BX:=	number of active EMM handles. Maximum of 255
Function 15/0	**Get Page Map (4E00h)**	
Input:	ES:DI=	pointer to area to save mapping context
Function 15/1	**Set Page Map (4E01h)**	
Input:	DS:SI=	array stored by a function 15/0 or 15/2

Function 15/2 — **Get and Set Page Map (4E02h)**
Input:
ESDI= pointer to area to save mapping context
DS:SI= array stored by a function 15/0 or 15/2

Function 15/3 — **Return Size (4E03h)**
Output:
AL= size in bytes of mapping context save area

Function 16/0 — **Get Partial Page Map (4F00h)**
Input:
DS:SI= structure with 16 bit count, followed by count words of segment addresses to be mapped
ES:DI= pointer to area to save specified context

Function 16/1 — **Set Partial Page Map (4F01h)**
Input:
DS:SI= pointer to context stored by 16/0 function

Function 16/2 — **Get Size of Partial Page Map (4F02h)**
Input:
BX= size of map in pages
Output:
AL= size of array in bytes

Function 17/0 — **Map/Unmap Multiple Pages (5000h)**
Input:
DX= handle
CX= number of pages
DS:SI= array of logical page # / physical page # pairs. A logical page of FFFh indicates Unmap.

Function 17/1 — **Map/Unmap Multiple Pages (5001h)**
Same as 17/0, except that segment addresses are used.

Function 18 — **Reallocates Pages (51f)**
Input:
DX= handle
BX= new number of pages

Function 19/0 — **Get Handle Attribute (5200h)**
Input:
DX= handle
Output:
AL= 0 if volatile,
1 if nonvolatile

Function 19/1 — **Set Handle Attribute (5201h)**
Input:
DX= handle
BL= new attribute

Function 19/2 — **Get Attribute Capacity (5202h)**
Output:
AL= 0 if volatile only,
1 if nonvolatile supported

Function 20/0 — **Get Handle Name (5300h)**
Input:
DX: handle
ES:DI= pointer to 8 character name

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Function 20/1 **Set Handle Name (5301h)**
Input: DX: handle
DS:SI= pointer to 8 character name

Function 21/0 **Get Handle Directory (5400h)**
Input: ES:DI= pointer for directory
Output: AL= number of entries in array

The ES:DI area contains a handle/handle name pair for each active handle.

Function 21/1 **Search for Named Handle (5401h)**
Input: DS:SI= pointer to handle name
Output: DX= value of named handle

Function 21/2 **Get Total Handles (5402h)**
Output: BX= maximum handles, including system handle

Function 22 **Alter Page Map & Jump (55h)**
Input: AL= zero if physical pages, one if segment values
DX= handle
DS:SI= map-and-jump structure

Function 23 **Alter Page Map and Call (56h)**
Input: AL= zero if physical pages, one if segment values
DX= handle
DS:SI= map and call structure

Function 23/2 **Get Stack Size (5602h)**
Output: BX= stack space required (in bytes) for the Alter Page Map and Call function

Function 24/0 **Move Memory Region (5700h)**
Input: DS:SI= move source dest structure

Function 24/1 **Exchange Memory Region (5701h)**
Input: DS:SI= move source dest structure

See function 24/0 for structure format.

Function 25/0 **Get Mappable Physical Address Array (5800h)**
Input: ES:DI= pointer to output array
Output: CX= number of entries in mappable phys page

Function 25/1 **Get Mappable Phys Addr Array Entries (5801h)**
Output: CX= # of entries in mappable phys page array

Function 26/0 **Get Hardware Configuretion Array (5900h)**
Input: ES:DI= pointer to output hardware info struct array

Function 26/1 **Get Unallocated Raw page Count (5901h)**
Output: BX= unallocated raw pages
DX= total raw pages

Function 27 **Allocate Raw Pages (5Ah)**
Input: BX= number of raw pages
Output: DX= raw handle

Function 28 **Alternate Map Register Set (5Bh)**
For use by operating environments only

Function 29 **Prepare Warm Boot (5Ch)**
For use operating environments only

Function 30 **Enable/Disable OS/E Function Set (5Dh)**
For use by environments only.

■ Status codes returned by Interrupt 67h

All interrupt 67h calls to the Expanded Memory Manager return a status code in register AH.

0	Normal completion
80h	EMM software error
81h	Hardware error
82h	Undefined
83h	Invalid handle specified
84h	Invalid function code
85h	All handles are in use
86h	SAVE or RESTORE mapping context error
87h	Not enough total pages
88h	Not enough pages available
89h	Invalid request for 0 pages
8Ah	Logical page number is out of range
8Bh	Physical page number is out of range
8Ch	The state save area is full
8Dh	The state save area has already been allocated a handle
8Eh	The state save area has not been allocated a handle
8Fh	Invalid subfunction number
90h	Undefined attribute type
91h	Non-volatility not supported
92h	Source and destination overlap
93h	Length exceeds allocated area
94h	Conventional and expanded memory overlap
95h	Offset overlaps page length
96h	Regin exceeds 1 Mb limit
97h	Source and destination overlap
98h	Invalid source/destination types
99h	Undefined
9Ah	Alternate map register set specified is not supported
9Bh	All alternate map/DMA register sets are allocated
9Ch	Alternate map/DMA register sets are not supported
9Dh	Invalid alternate map/DMA register sets
9Eh	Defined DMA not supported
9Fh	Invalid DMA channel
A0h	Handle not found
A1h	Handle name already assigned
A2h	Invalid memory wrap
A3h	Invalid input data structure
A4h	Access denied

■ Disk Cache

Disk Cache is a utility program that improves hard disk performance. Disk Cache reduces the number of disk reads and writes, improving the overall response time for most applications.
The disk cache utility creates a cache buffer in memory and stores frequently accessed disk data there. Whenever the processor requests a disk read, disk cache first looks for the data in the cache buffer. If the data is in the cache buffer, it is loaded from the buffer instead of the disk.

Write caching	Disk-write data can automatically be copied to cache buffer memory.
Smart write	When a disk write is requested, disk cache first checks to see if the data has changed since it was read. If it hasn't changed, no write takes place.
Cache buffer location	The cache buffer can be located in base, extended, or expanded (using EMS) memory.
Cache buffer size	The cache buffer size in kilobytes (KB) is adjustable.
Page size	The number of sectors per page is adjustable.
Boot startup	Disk Cache is loaded when the system boots. It can be configured to activate immediately after boot or after a DOS command.

What You Need To Run Disk Cache
To run Disk Cache a machine requires:
DOS version 3.0 or higher.
PC/XT, PC/AT, or PS/2 compatibility
Hard disk drive (disk caching doesn't run with diskette drives)

Memory requirements
If the cache buffer is located in expanded memory, EMM version 3.2 or higher is required.
If the cache buffer is located in base memory, base memory must have at least 256 KB.
If the cache buffer is located in expanded or extended memory, the expanded or extended memory must have at least 64 KB

Installation
Insert the Disk Cache distribution diskette into drive A and type:
acache/setup Enter . The setup screen appears:

Disk Cache

Setup Program

AEG Disk Cache Driver Version x.xx (C) Copyright xxxx, AEG Olympia	
Boot drive :	C
Buffer in:	Base Memory
Buffer size:	128 KB
Page length:	4 Sectors
Turn ON/OFF:	On
Cache write:	Off
Smart write:	Off
1.Press .oder ,	to move cursor
2.Press SPACE	to select values
3.Press F10	to save new setup
4.Press ESC	to EXIT

The setup screen displays seven default parameters. These parameter values are correct for most systems. To change parameters, press the up- and down-arrow keys to move the highlight to the parameters you want to change. Press the space bar to display the value you desire. To change the buffer size, press the backspace key to remove the old value. Enter the correct value. Press F10 to save the new parameters and copy the disk cache files to the Hard disk drive.

Setup also modifies the CONFIG.SYS file on your fixed drive to start the ACACHE.SYS device driver automatically each time the system boots. The display shows:

```
Creating backup file ==>C:\CONFIG.BAK
Updating ==>Config.sys
Copying ACACHE.SYS ==>C:\ACACHE.SYS
Copying ACACHE.EXE ==>C:\ACACHE.EXE

Cache drive setup successful
Reboot to install the disk cache
```

Press the reset button to reset your system. Disk Cache automatically starts running. When the cache driver is installed (after boot) the system displays the condition of the program.

Using Disk Cache
Syntaxes for invoking ACACHE.EXE and ACACHE.SYS on the distribution diskette. ACACHE.SYS is an installable device driver that manages a portion of the computer memory as a disk cache. ACACHE.EXE controls the device driver and displays cache status and statistics. ACACHE.EXE also provides a HELP command and installs the disk cache onto a hard disk drive.

ACACHE.SYS -- Disk Cache Device Driver
ACACHE.SYS is invoked in CONFIG.SYS. The command ine included in CONFIG.SYS has the following sysntax:

DEVICE=ACACHE.SYS [ssss][/A|/E|/LOADALL][/Pxx][/OFF][/OFF][/CW][/SW]

ssss Cache buffer size in kB. The valid range is from 64 to 15360 (64kB to 15 MB). The default value is 128 KB for base memory and 256 KB for expanded or extended memory.

/Pxx Cache page size in sectors. Valid values for xx are 1,2,4,8, and 16. The default value is 4 sectors.

/E,/A, /LOAD-ALL Specify which memory the cache buffer is located in. If no switch is included in the command line, the cache buffer is located in base memory (below 640 kB)

/E Locates the cache buffer in extended memory (above 1 M). Data is moved in and out of extended memory using the BIOS block move call (INT15 BLKMOV).

/A Locates the buffer in expanded memory. The EMM driver must be installed before installing the disk cache.

/LOADALL Should be used on 80286 machines instead of /E for better performance. /LOADALL uses the 80286 LOADALL instruction to transfer data to and from extended memory.

/OFF Disables disk caching. If no switch is included in the command line, the system boots with disk caching enabled.

/CW Enables caching disk write data. If no switch is included in the command line, disk write data is not cached.

/SW Enables smart write mode. If no switch is included in the command line, smart write mode is disabled.

Disk Cache

ACACHE.EXE -- Disk Cache User Interface
ACACHE.EXE is a DOS command that configures disk cache options, installs the disk cache onto a system, and provides status and statistic reports. The syntax of ACACHE.EXE is:

ACACHE [/SETUP|/HELP|/Status|/FLUSH|/ON|/OFF|/NOSW|/SW|/NOCW|/CW]

/SETUP Runs the menu driven setup program for configuring disk cache parameters.

/HELP Displays the helb screens. May be abbreviated /H.

/STATUS Displays the cache driver status and statistics. May be abbriviated /ST.

/FLUSH Flushes the cache buffer and statistics information.

/ON Turns on disk caching. If the cache buffer is located in expanded memory, ACACHE.SYS will request EMM to allocate expanded memory.

/OFF Turns off disk caching. If the cache buffer is located in expanded memory, EMM will deallocate the cache buffer memory and make it available to other applications.

/NOSW Disables smart write mode.

/SW Enables smart write mode. The /SW switch improves the performance of applications that frequently write the same data to disk. Smart write reduces the number of disk writes made on your system. Whenever data in the cache buffer is written to disk, disk cache first checks if the data has been changed since the last time it was written. If there have been no changes, nothing is written to the disk.

/NOCW Disables cached disk writes.

/CW Enables cached disk writes. Theese switch will improve the performance or applications that repeatedly read and write the same data (such as disk sort utilities and data base management systems.)

If ACACHE.EXE changes any parameters, the status display will show the new values.

Status & Statistics

AEG Disk Cache Driver Version x.xx (C) Copyright xxxx, AEG Olympia		
Cache buffer in	:	Base memory
Cache Buffer size	:	128 KB
Cache Page length	:	4 sectors
Cache status	:	On
Cache Write	:	On
Smart Write	:	On
Total read requests	=	2562 sectors
Read from cache	=	1404 sectors
Read hit ratio	=	57.78 %
Total write request	=	282 sectors
Smart write saved	=	3 sectors
Smart write ratio	=	1.06 %
Average read size	=	1.73 sectors
Average write size	=	1.00 sectors

F

The status and statistics displays the current disk cache parameters as configured in the setup screen. The statistics indicate how much the disk cache is saving.

Flushing the cache buffer and statistics is useful when you want to see how much you gain on a particular software program by using the disk cache. Type the **ACACHE/Flush** command before starting your your program.
Some programs require large amounts of data from several locations on the hard disk. These programs do not run well with disk caching. Turn off disk caching by typing: **ACACHE/OFF** Disk caching disabled. Disk Cache is restarted by typing **ACACHE/ON** Disk caching enabled.

■ Changing the clock frequency

Certain programs require that the computer processor frequency be changed. The computer is supplied with the highest frequency turned on (the "Speed" indicator lamp is ON).
The frequency is changed between the highest and lowest speed by simultaneously pressing:

Control + Alt + + (on the numeric keypad).
(See section "SYSCONF.EXE)

SYSCONF.EXE

■ SYSCONF.EXE

This utility program enables you to display or change your system configuration.
There are four SYSCONF commands:

1. SYSCONF
2. SYSCONF/SETUP
3. SYSCONF[op]+
4. SYSCONF?

■ Loading SYSCONF

Turn the system on and insert the utility program disk in drive A.
Enter **sysconf**
SYSCONF checks the system BIOS and displays the configuration values.

■ Loading SETUP

In order to load the Setup program:
enter **sysconf /setup**
The Setup Main Menu appears, and the values can be changed, if required.
(See "Software configuration").

■ System Environment Parameter

The SYSCONF [op]+ command lets you change the system configuration parameters for system speed, BIOS location and write protection of the drives, without entering the SETUP program.
SYSCONF [op]+ has the syntax:
/D:RO /D:RW /F:RO /F:RW /B:RAM /B:ROM /S:TOP /S:LOW /S:SMART /PARK

■ Help screen

The "Help" command **sysconf ?** calls explanations to the parameters and options to the screen.

■ Error messages

SYSCONF.EXE cannot run on this machine
Your system does not have the relevant BIOS

Invalid option : xxxx
Invalid operand entered

Function fail : xxxx
The operand entered is not supported by the system

Function ignored : xxxx
Operand entered is ignored

No attached fixed disk found
Your system as no hard disk when the /PARK command is entered

■ Park utility (preparation for transport)

The /**PARK** utility program prepares the computer for transport by parking the hard disk read/write heads. It is recommended to make backup copies of the data on the hard disk before transport.

At the DOS command, enter:
SYSCONF /park

```
Fixed Disk Head is Parked,
You Can Turn Off System Now!
================
<Press ENTER key to continue>
```

When the above message appears, the computer is prepared for transport. The computer can be turned off. After transportation, restart the computer, and the read/write heads return to their working position.

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